



PTO/SB/08A (08-03)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 1 of 4

**Complete if Known**

Application Number	10/804,810
Filing Date	March 19, 2004
First Named Inventor	Jonathan J. Wierer Jr.
Art Unit	2818
Examiner Name	Ho, Tu Tu V
Attorney Docket Number	LUM-03-05-01

**U. S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
TH		US- 2002/0130311 A1	9-19-2002	Lieber et al.	
		US- 2003/0089899 A1	5-15-2003	Lieber et al.	
		US- 2004/0213307 A1	10-28-2004	Lieber et al.	
		US- 6,770,353 B1	8-3-2004	Mardilovich et al.	
		US- 2005/0011431 A1	1-20-2005	Samuelson et al.	
		US- 2003/0016895 A1	1-23-2003	Holm et al.	
		US- 5,371,025	12-6-1994	Sung	
		US- 6,831,302 B2	12-14-2004	Erchak et al.	
		US- 2005/0145877 A1	7-7-2005	Erchak	
		US- 2005/0127375 A1	6-16-2005	Erchak et al.	
		US- 2005/0087757 A1	4-28-2005	Erchak et al.	
		US- 2005/0087754 A1	4-28-2005	Erchak	
		US- 2005/0051787 A1	3-10-2005	Erchak et al.	
		US- 2005/0051785 A1	3-10-2005	Erchak et al.	
		US- 2005/0040424 A1	2-24-2005	Erchak et al.	
		US- 2005/0040419 A1	2-24-2005	Erchak et al.	
		US- 2004/0207323 A1	10-21-2004	Erchak et al.	
		US- 2004/0207320 A1	10-21-2004	Erchak	
TH		US- 2004/0109644 A1	6-10-2004	Assefa et al.	

**FOREIGN PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>4</sup>
		Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)				
TH		WO 2004/004927 A2	1-15-2004	BTG International		
		WO 2004/032193 A2	4-15-2004	Nanosys, Inc.		
		WO 2004/034025 A2	4-22-2004	Nanosys, Inc.		
		WO 2004/038767 A2	5-6-2004	President and Fellows		
		EP 0 874 405 A2	10-28-1998	Mitsubishi Cable Ind.		
TH		WO 03/023857 A2	3-20-2003	Luca Ag		

Examiner Signature TH - TH + HO

Date Considered

Sept 2005

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND

TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO

## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

*(Use as many sheets as necessary)*

Sheet	2
-------	---

2

--	--

4

**Complete if Known**

Application Number	10/804.810
--------------------	------------

Filing Date	March 19, 2004
-------------	----------------

First Named Inventor	Jonathan J. Wierer Jr.
----------------------	------------------------

Art Unit	2818
----------	------

Examiner Name	Ho, Tu Tu V
---------------	-------------

Attorney Docket Number	LUM-03-05-01
------------------------	--------------

## U. S. PATENT DOCUMENTS

[illegible]

## FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T <sup>2</sup>
		Country Code <sup>3</sup> Number* Kind Code <sup>6</sup> (if known)	MM-DD-YYYY			
THP		EP 1 071 143 A1	1-24-2001	Mitsubishi Cable Ind.		

**Examiner  
Signature**

These 40

Data Considered	Model	Results
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
23	23	23
24	24	24
25	25	25
26	26	26
27	27	27
28	28	28
29	29	29
30	30	30

Sept 2005

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

**If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.**

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)		<b>Complete if Known</b>	
		Application Number	Not yet assigned
		Filing Date	March 19, 2004
		First Named Inventor	Jonathan J. Wierer,
		Art Unit	Not yet assigned
		Examiner Name	Not yet assigned
Sheet 3 of 4	Attorney Docket Number	LUM-03-05-01	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
He		M. FUJITA et al., "Organic light-emitting diode with ITO/organic photonic crystal," Electronics Letters, 27th November 2003, Vol. 39, No. 24, 2 pages.	
		T.N. ODER et al., "III-nitride blue and ultraviolet photonic crystal light emitting diodes," Applied Physics Letter, Vol. 84, No. 4, 26 January 2004, pp. 466-468.	
		HIROYUKI ICHIKAWA et al., "Efficiency enhancement in a light-emitting diode with a two-dimensional surface grating photonic crystal," Applied Physics Letters, Vol. 84, No. 4, 26 January 2004, pp. 457-459.	
		J. RISTIC et al., "Characterization of GaN quantum discs embedded in AlxGa1-xN nanocolumns grown by molecular beam epitaxy," Physical Review B68, (2003), The American Physical Society, pp. 125305-1 to 125305-5.	
		J.NOBORISAKA et al., "Catalyst-free growth of GaAs nanowires by selective-area metalorganic vapor-phase epitaxy," Applied Physics Letters 86, (2005), American Institute of Physics, pp. 213102-1 to 213103-3.	
		T. HAMANO et al. "New Technique for Fabrication of Two-Dimensional Photonic Bandgap Crystals by Selective Epitaxy," Jpn. J. Appl. Phys. Vol. 36 (1997), pp. L286 to L288.	
		S. HAFFOUZ et al., "Effect of Magnesium and Silicon on the lateral overgrowth of GaN patterned substrates by Metal Organic Vapor Phase Epitaxy," MRS Internet J. Nitride Semicond. Res. 3, 8 (1998), 1998-1999 The Materials Research Society, pp. 1 to 6	
		G. KIPSHIDZE et al., "Controlled growth of GaN nanowires by pulsed metalorganic chemical vapor deposition," Applied Physics Letters 86, (2005) American Institute of Physics, pp. 033104-1 to 033104-3.	
		KWA-MOK KIM et al., "Growth and characterization of single-crystal GaN nanorods by hydride vapor phase epitaxy," Applied Physics Letters, Vol. 81, No. 12, 16 September 2002, pp. 2193 to 2195.	
He		S. HAN et al, "Controlled growth of gallium nitride single-crystal nanowires using a chemical vapor deposition method," J. Mater. Res., Vol. 18, No. 2, Feb. 2003, Materials Research Society, pp. 245 to 249.	

Examiner Signature	He He HO	Date Considered	Sept 2005
--------------------	----------	-----------------	-----------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

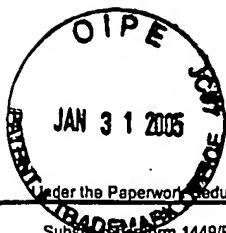
Substitute for form 1449/PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)		Application Number	Not yet assigned
		Filing Date	March 19, 2004
		First Named Inventor	Jonathan J. Wierer,
		Art Unit	Not yet assigned
		Examiner Name	Not yet assigned
Sheet 4 of 4	Attorney Docket Number	LUM-03-05-01	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
TH		HWA-MOK KIM, et al., "Nanoscale Ultraviolet-Light-Emitting Diodes Using Wide-Bandgap Gallium Nitride Nanorods," Adv. Mater. 2003, 15, No. 7-8, April 17, WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim, pp. 567 to 569.	
		T. KUYKENDALL ET AL., "Metalorganic Chemical Vapor Deposition Route to GaN Nanowires with Triangular Cross Sections," Nano Letters, 2003, Vol. 3, No. 8, American Chemical Society, pp. 1063 to 1066.	
		HWA-MOK KIM, et al., "High-Brightness Light Emitting Diodes Using Dislocation-Free Indium Gallium Nitride/Gallium Nitride Multiquantum-Well Nanorod Arrays, Nano Letters 2004, Vol. 4, No. 6, American Chemical Society, pp. 1059 to 1062.	
		V.V. MAMUTIN, et al., "Growth of Self-Organized GaN Nanostructures on Al <sub>2</sub> O <sub>3</sub> (0001) by RF MBE., Proc. Int. Workshop on Nitride Semiconductors, IPAP Conf. Series 1, pp. 413 to 416.	
		J. SU et al., "Catalytic growth of group III-nitride nanowires and nanostructures by metalorganic chemical vapor deposition," Applied Physics Letters 86, (2005), American Institute of Physics, pp. 013105-1 to 013105-3.	
		W. D. ZHOU et al, "Electrically injected single-defect photonic bandgap surface-emitting laser at room temperature," Electronic Letters, 31st August 2000, Vol. 36, No. 18, pp. 1541 to 1542.	
		P. BHATTACHARYA et al., "Electrically Injected Photonic Bandgap Microcavity Light Sources," LEOS 2001 14th. Annual Meeting of the IEEE Lasers & Electro-Optics Society, San Diego, Ca, Nov. 11-15, Vol 1 of 2, pp. 76 to 77.	
		S. KITAMURA et al, "Fabrication of GaN Hexagonal Pyramids on Dot-Patterned GaN/Sapphire Substrates via Selective Metalorganic Vapor Phase Epitaxy, Jpn. J. Appl. Phys., Vol. 34 (1995), Part 2, No. 9B, 15 September 1995, pp. L1184 to L1186.	
		M. NAGAHARA et al., "Selective Growth of Cubic GaN in Small Areas on Patterned GaAs (100) Substrates by Metalorganic Vapor Phase Epitaxy," Jpn. J. Appl. Phys., Vol. 33 (1994), Part 1, No. 1B, January 1994, pp. 694 to 697.	
TH		A. KIKUCHI et al., "Self-Organized InGaN/GaN Multiple Quantum Well Nanocolumn Light Emitting Diodes Grown On (111) Si Substrate," Department of Electrical and Electronics Engineering, Sophia University, 1 page.	

Examiner Signature	TH - TH HO	Date Considered	Sept 2005
--------------------	------------	-----------------	-----------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.  
1 Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.  
This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.



PTO/SB/08A (08-03)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitution Form 1449/PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

**Complete if Known**

Application Number	10/804,810
Filing Date	March 19, 2004
First Named Inventor	Jonathan J. Wierer Jr.
Art Unit	2879-2818
Examiner Name	Not yet known
Attorney Docket Number	LUM-03-05-01

Sheet 1 of 3

**U. S. PATENT DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
TH		US- 5,779,924	7-14-1998	Krames et al.	
		US- 2004/0016936 A1	1-29-2004	Tanaka et al.	
		US- 2003/0141507 A1	7-31-2003	Krames et al.	
		US- 6,307,218 B1	10-23-01	Steigerwald et al.	
		US- 6,363,096	3-26-2002	Dodabalapur et al.	
		US- 6,335,548	1-1-2002	Roberts et al.	
		US- 6,156,581	12-5-2000	Vaudo et al.	
TH		US- 5,955,749	9-21-1999	Joannopoulos et al.	
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			
		US-			

**FOREIGN PATENT DOCUMENTS**

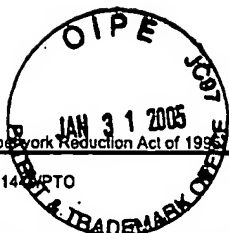
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T <sup>3</sup>
		Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)				
TH		JP 07176788	7-1995	Kurahashi		

Examiner Signature	TH STE HIO	Date Considered	Sept 2005
--------------------	------------	-----------------	-----------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. <sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.



PTO/SB/08B (08-03)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449 PTO

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

**Complete if Known**

Application Number	10/804,810
Filing Date	March 19, 2004
First Named Inventor	Jonathan J. Wierer Jr.
Art Unit	2879 2818
Examiner Name	Not yet known
Attorney Docket Number	LUM-03-05-01

Sheet 2 of 3

**NON PATENT LITERATURE DOCUMENTS**

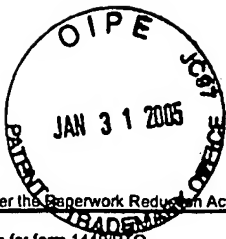
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
TH		J.J. WIERER et al., "InGaN/GaN quantum-well heterostructure light-emitting diodes employing photonic crystal structures," Applied Physics Letters, Vol. 84, No. 19, May 10, 2004, pp. 3885-3887.	
		<del>US Patent Application Serial No. 10/804,810, filed March 19, 2004 entitled "Photonic Crystal Light Emitting Device," 28 pages.</del>	Self
TH		LEE et al., "Modified spontaneous emission from a two-dimensional photonic bandgap crystal slab," J. Opt. Soc. Am. B, Vol. 17, No. 8, August 2000, pp. 1438-1442.	
		BORODITSKY et al., "Surface recombination measurements on III-V candidate materials for nanostructure light-emitting diodes," Journal of Applied Physics, Vol. 87, No. 7, April 1, 2000, pp. 3497-3504.	
		BORODITSKY et al., "Light extraction from optically pumped light-emitting diode by thin-slab photonic crystals," Applied Physics Letters, Vol. 75, No. 8, August 23, 1999, pp. 1036-1038.	
		WINDISCH et al., "Light-emitting diodes with 31% external quantum efficiency by outcoupling of lateral waveguide modes," Applied Physics Letters, Vol. 74, NO. 16, April 19, 1999, pp. 2256-2258.	
		XU et al., "Finite-difference time-domain calculation of spontaneous emission lifetime in a microcavity," J. Opt. Soc. Am. B, Vol. 16, No. 3, March, 1999, pp. 465-474.	
		HWANG et al., "Spontaneous emission rate of an electric dipole in a general microcavity," Physical Review B, Vol. 60, No. 7, August 15, 1999, pp. 4688-4695.	
		FAN et al., "High Extraction Efficiency of Spontaneous Emission from Slabs of Photonic Crystals," Physical Review Letters, Vol. 78, No. 17, April 28, 1997, pp. 3294-3297.	
TH		Vuckovic et al., "Surface Plasmon Enhanced Light Emitting Diode," Journal of Quantum Electronics, Vol. 36, 2000, pp. 1-13.	

Examiner Signature	TH TH TH	Date Considered	Sept 2005
--------------------	----------	-----------------	-----------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.



PTO/SB/088 (08-03)

Approved for use through 07/31/2006. OMB 0851-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)	<b>Complete if Known</b>		
	Application Number	10/804,810	
	Filing Date	March 19, 2004	
	First Named Inventor	Jonathan J. Wierer Jr.	
	Art Unit	2879	
	Examiner Name	Not yet known	
Sheet 3 of 3	Attorney Docket Number	LUM-03-05-01	

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
TH		Tredicucci et al., "Single-mode surface-plasmon laser," Applied Physics Letters, Vol. 76, No. 16, April 17, 2000, pp. 2164-2166.	
TH		Imada et al., "Coherent two-dimensional lasing action in surface-emitting laser with triangular-lattice photonic crystal structure," Applied Physics Letters, Vol. 75, No. 3, July 19, 1999, pp. 316-318.	
TH		Pottage et al., "Vertical-cavity surface-emitting resonances in photonic crystal films," J. Opt. Soc. Am. A, Vol. 18, No. 2, February 2001, pp. 442-447.	
TH		TIWARI, S., "Compound Semiconductor Device Physics," Academic Press, Inc., San Diego, CA, 1992, pp. 182-186.	
TH		G.B. STRINGFELLOW and M. GEORGE CRAWFORD, eds., "High Brightness Light Emitting Diodes," Academic Press, Inc., 1997, Chapter 5, "AlGaInP Light-Emitting Diodes," by F.A. KISH and R.M. FLETCHER, pp. 149-170.	
TH		US Patent Application Serial No. 10/691,026, filed October 21, 2003, entitled "Photonic Crystal Light Emitting Device," 30 pages.	

Examiner Signature	TH TH TH	Date Considered	Sept 2005
--------------------	----------	-----------------	-----------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

**If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.**



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (Use as many sheets as necessary)		<b>Complete if Known</b>			
		Application Number	Not yet assigned 10/804,810		
		Filing Date	March 19, 2004		
		First Named Inventor	Jonathan J. Wierer,		
		Art Unit	Not yet assigned 2818		
		Examiner Name	Not yet assigned		
Sheet		of		Attorney Docket Number	LUM-03-05-01

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
JH		P.A. KOHL, "Photoelectrochemical etching of semiconductors", IBM J. Res. Develop., Vol. 42, No. 5, 5 September 1998, pp. 629-637.	
		Chen-Fu CHU et al., "Comparison of p-Side Down and p-Side Up GaN Light-Emitting Diodes Fabricated by Laser Lift-Off", Jpn. J. Appl. Phys., Vol. 42 (2003), Part 2, NO. 2B, 15 February 2003, pp. L147-L150.	
		W.S. WONG et al., "InxGa1-xN light emitting diodes on Si substrates fabricated by Pd-In metal bonding and laser lift-off", Applied Physics Letters, Vol. 77, No. 18, 30 October 2000, pp. 2822-2824.	
		H. BENISTY et al., "Impact of Planar Microcavity Effects on Light Extraction - Part I: Basic Concepts and Analytical Trends", IEEE Journal of Quantum Electronics, Vol. 34, No. 9, September 1998, pp. 1612-1631.	
		T. FUJII et al., "Increase in the extraction efficiency of GaN-based light-emitting diodes via surface roughening", Applied Physics Letters, Vol. 84, No. 6, 9 February 2004, pp. 855-857.	
		Y.-K. SONG et al., "Resonant-cavity InGaN quantum-well blue light-emitting diodes", Applied Physics Letters, Vol. 77, No. 12, 18 September 2000, pp. 1744-1746.	
JH		Michael R. KRAMES et al., U.S. Application No. 10/059,588, filed January 28, 2002, entitled: "LED Efficiency Using Photonic Crystal Structure". 62 pages.	
		Jonathan J. Wierer Jr., U.S. Application No. 10/691,026 filed 10/21/03, entitled: "Photonic Crystal Light Emitting Device", 30 pages.	

(duplicate)

Examiner Signature	JH JH HO	Date Considered	Sept 2005
--------------------	----------	-----------------	-----------

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.